

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Cancelled).
2. (Currently Amended) ~~The motor controller of claim 1,~~ A motor controller including a position sensing device having a position sensor for sensing a magnetic pole of a motor, a driver for driving the motor, and a wiring section for feeding a power supply voltage from the driver into the position sensing device, wherein

the position sensing device comprises:

a superposed wave transmitter coupled to a first end of the wiring section;

a serial converter for converting a signal of the position sensor into a serial signal; and

a sensing-device interface disposed between the serial converter and the superposed wave transmitter,

the driver comprises:

a dc power supply;

a superposed wave receiver coupled between the dc power supply and a second end of the wiring section;

a parallel converter for converting the serial signal into a parallel signal;

a driver interface disposed between the superposed wave receiver and the parallel converter; and

a power switching circuit to be driven by the parallel signal,

wherein the serial signal is superposed to the wiring section and transmitted, and the power switching circuit switches a phase excitation for driving the motor, and

wherein the superposed wave transmitter includes a sensing-device transformer, which has a power supply wire-wound section coupled to the first end of the wiring section and a signal wire-wound section coupled to the sensing-device interface; and

the superposed wave receiver includes a driver transformer, which has a power supply wire-wound section coupled to the second end of the wiring section and a signal wire-wound section coupled to the driver interface.

3. (Original) The motor controller of claim 2, wherein the sensing-device interface has a transmitting circuit, and the driver interface has a receiving circuit, and the serial signal is transmitted from the sensing device to the driver in one way.

4. (Original) The motor controller of claim 2,

wherein the sensing-device interface and the driver interface have respectively a transceiver,

wherein the serial signal is transmitted from the sensing device to the driver, and a control signal for adjusting synchronization of communication is transmitted from the driver to the position sensing device.

5. (Original) The motor controller of claim 2, wherein the position sensing device further includes an A/D converter, and the signal of the position sensor is converted into a digital signal, then fed into the serial converter.

6. (Original) The motor controller of claim 5, wherein the position sensor is formed of three or two Hall elements, which are arranged at intervals of 120 degrees.

7. (Original) The motor controller of claim 5, wherein the position sensor is formed of two Hall elements, which are arranged at an interval of 90 degrees.

8. (Original) The motor controller of claim 2, wherein the position sensing device further includes a power incoming section, wherein the power supply wire-wound section of the sensing-device transformer is inserted between a positive side and a negative side in series between the wiring section and the power incoming section, wherein the power incoming section forms a power supply of the position sensing device.

9. (Original) The motor controller of claim 2, wherein the power supply wire-wound section of the driver transformer is inserted between a positive side and a negative side in series of the dc power supply.

10. (Original) The motor controller of claim 8, wherein the position sensing device further includes a capacitor coupled to the power incoming section in parallel.

11. (Original) The motor controller of claim 2, wherein the driver further includes a capacitor coupled to the dc power supply in parallel.

12. (Original) The motor controller of claim 2, wherein the driver further includes a resistor having a resisting value similar to a characteristic impedance of the wiring section, and the resistor is coupled to the wiring section in parallel.

13. (Original) The motor controller of claim 12, wherein the driver further includes a capacitor coupled to the resistor in series.

14. (Original) The motor controller of claim 2, wherein the wiring section comprises one of twisted two cables and a pair of shielded twisted cables.

15. (Currently Amended) ~~The motor controller of claim 1,~~ A motor controller including a position sensing device having a position sensor for sensing a magnetic pole of a motor, a driver for driving the motor, and a wiring section for feeding a power supply voltage from the driver into the position sensing device, wherein

the position sensing device comprises:

a superposed wave transmitter coupled to a first end of the wiring section;

a serial converter for converting a signal of the position sensor into a serial signal; and

a sensing-device interface disposed between the serial converter and the superposed wave transmitter,

the driver comprises:

a dc power supply;

a superposed wave receiver coupled between the dc power supply and a second end of the wiring section;

a parallel converter for converting the serial signal into a parallel signal;

a driver interface disposed between the superposed wave receiver and the parallel converter; and

a power switching circuit to be driven by the parallel signal,

wherein the serial signal is superposed to the wiring section and transmitted, and the power switching circuit switches a phase excitation for driving the motor, and

wherein the superposed-wave transmitter is equipped with a choke coil disposed on the sensing device side, coupled to a first end of the wiring section, and a coupling capacitor disposed on the sensing device side and coupled between the first end of the wiring section and the sensing-device interface, and

wherein the superposed-wave receiver is equipped with a choke coil disposed on the driver side, coupled between the dc power supply and a second end of the wiring section, and a coupling capacitor disposed on the driver side and coupled between the second end of the wiring section and the driver interface.

16. (Original) The motor controller of claim 15, wherein the sensing-device interface has a transmitting circuit, the driver interface has a receiving circuit, and the serial signal is transmitted from the sensing device to the driver in one direction.

17. (Original) The motor controller of claim 15,

wherein the sensing-device interface and the driver interface have respectively a transceiver,

wherein the serial signal is transmitted from the sensing device to the driver, and a control signal for adjusting synchronization of communication is transmitted from the driver to the position sensing device.

18. (Original) The motor controller of claim 15, wherein the position sensing device further includes an A/D converter, and the signal of the position sensor is converted into a digital signal, then fed into the serial converter.

19. (Original) The motor controller of claim 18, wherein the position sensor is formed of three or two Hall elements, which are arranged at intervals of 120 degrees.

20. (Original) The motor controller of claim 18, wherein the position sensor is formed of two Hall elements, which are arranged at an interval of 90 degrees.

21. (Original) The motor controller of claim 15, wherein the position sensing device further includes a power incoming section, wherein the choke coil disposed on the position sensing device side is inserted between a positive side and a negative side in series between the wiring section and the power incoming section, wherein the power incoming section forms a power supply of the position sensing device.

22. (Original) The motor controller of claim 15, wherein the choke coil disposed on the driver side is inserted between a positive side and a negative side in series of the dc power supply.

23. (Original) The motor controller of claim 21, wherein the position sensing device further includes a capacitor coupled to the power incoming section in parallel.

24. (Original) The motor controller of claim 15, wherein the driver further includes a capacitor coupled to the dc power supply in parallel.

25. (Original) The motor controller of claim 15, wherein the driver further includes a resistor having a resisting value similar to a characteristic impedance of the wiring section, and the resistor is coupled to the wiring section in parallel.

26. (Original) The motor controller of claim 25, wherein the driver further includes a capacitor coupled to the resistor in series.

27. (Original) The motor controller of claim 15, wherein the wiring section comprises one of twisted two cables and a pair of shielded twisted cables.

28. (Currently Amended) ~~The motor controller of claim 1,~~A motor controller including a position sensing device having a position sensor for sensing a magnetic pole of a motor, a driver for driving the motor, and a wiring section for feeding a power supply voltage from the driver into the position sensing device, wherein

the position sensing device comprises:

a superposed wave transmitter coupled to a first end of the wiring section;

a serial converter for converting a signal of the position sensor into a serial signal; and

a sensing-device interface disposed between the serial converter and the superposed wave transmitter,

the driver comprises:

a dc power supply;

a superposed wave receiver coupled between the dc power supply and a second end of the wiring section;

a parallel converter for converting the serial signal into a parallel signal;

a driver interface disposed between the superposed wave receiver and the parallel converter; and

a power switching circuit to be driven by the parallel signal.

wherein the serial signal is superposed to the wiring section and transmitted, and the power switching circuit switches a phase excitation for driving the motor, and

wherein the superposed-wave transmitter is equipped with a choke coil disposed on the sensing device side, coupled to a first end of the wiring section, and a coupling capacitor disposed on the sensing device side and coupled between the first end of the wiring section and the sensing-device interface, and

wherein the superposed-wave receiver includes a driver transformer, and the transformer is equipped with a power supply wire-wound section coupled to a second end of the wiring section and a signal wire-wound section coupled to the driver interface.

29. (Original) The motor controller of claim 28, wherein the interface included in the sensing device has a transmitting circuit, the driver interface has a receiving circuit, and the serial signal is transmitted from the sensing device to the driver in one direction.

30. (Original) The motor controller of claim 28,

wherein the sensing-device interface and the driver interface have respectively a transceiver,

wherein the serial signal is transmitted from the sensing device to the driver, and a control signal for adjusting synchronization of communication is transmitted from the driver to the position sensing device.

31. (Original) The motor controller of claim 28, wherein the position sensing device further includes an A/D converter, and the signal of the position sensor is converted into a digital signal, then fed into the serial converter.

32. (Original) The motor controller of claim 31, wherein the position sensor is formed of three or two Hall elements, which are arranged at intervals of 120 degrees.

33. (Original) The motor controller of claim 31, wherein the position sensor is formed of two Hall elements, which are arranged at an interval of 90 degrees.

34. (Original) The motor controller of claim 28, wherein the position sensing device further includes a power incoming section, wherein the choke coil disposed on the position sensing device side is inserted between a positive side and a negative side in series between the wiring section and the power incoming section, wherein the power incoming section forms a power supply of the position sensing device.

35. (Original) The motor controller of claim 28, wherein the power supply wire-wound section of the driver transformer is inserted between a positive side and a negative side in series of the dc power supply.

36. (Original) The motor controller of claim 34, wherein the position sensing device further includes a capacitor coupled to the power incoming section in parallel.

37. (Original) The motor controller of claim 28, wherein the driver further includes a capacitor coupled to the dc power supply in parallel.

38. (Original) The motor controller of claim 28, wherein the driver further includes a resistor having a resisting value similar to a characteristic impedance of the wiring section, and the resistor is coupled to the wiring section in parallel.

39. (Original) The motor controller of claim 38, wherein the driver further includes a capacitor coupled to the resistor in series.

40. (Original) The motor controller of claim 28, wherein the wiring section comprises one of twisted two cables and a pair of shielded twisted cables.

41. (Currently Amended) The motor controller of claim 1, A motor controller including a position sensing device having a position sensor for sensing a magnetic pole of a motor, a driver for driving the motor, and a wiring section for feeding a power supply voltage from the driver into the position sensing device, wherein

the position sensing device comprises:

a superposed wave transmitter coupled to a first end of the wiring section;

a serial converter for converting a signal of the position sensor into a serial signal; and

a sensing-device interface disposed between the serial converter and the superposed wave transmitter,

the driver comprises:

a dc power supply;

a superposed wave receiver coupled between the dc power supply and a second end of the wiring section;

a parallel converter for converting the serial signal into a parallel signal;

a driver interface disposed between the superposed wave receiver and the parallel converter; and

a power switching circuit to be driven by the parallel signal,

wherein the serial signal is superposed to the wiring section and transmitted, and the power switching circuit switches a phase excitation for driving the motor, and

wherein the superposed-wave transmitter includes a sensing-device transformer, which is equipped with a power supply wire-wound section coupled to a first end of the wiring section, and a signal wire-wound section coupled to the sensing device interface, and

wherein the superposed-wave receiver is equipped with a choke coil disposed on the driver side, coupled between the dc power supply and a second end of the wiring section, and a coupling capacitor disposed on the driver side and coupled between the second end of the wiring section and the driver interface.

42. (Original) The motor controller of claim 41, wherein the sensing-device interface has a transmitting circuit, the driver interface has a receiving circuit, and the serial signal is transmitted from the sensing device to the driver in one direction.

43. (Original) The motor controller of claim 41,

wherein the sensing-device interface and the driver interface have respectively a transceiver,

wherein the serial signal is transmitted from the sensing device to the driver, and a control signal for adjusting synchronization of communication is transmitted from the driver to the position sensing device.

44. (Original) The motor controller of claim 41, wherein the position sensing device further includes an A/D converter, and the signal of the position sensor is converted into a digital signal, then fed into the serial converter.

45. (Original) The motor driver of claim 44, wherein the position sensor is formed of three or two Hall elements, which are arranged at intervals of 120 degrees.

46. (Original) The motor driver of claim 44, wherein the position sensor is formed of two Hall elements, which are arranged at an interval of 90 degrees.

47. (Original) The motor controller of claim 41, wherein the position sensing device further includes a power incoming section, wherein the power supply wire-wound section of the sensing-device transformer is inserted between a positive side and a negative side in series between the wiring section and the power incoming section, wherein the power incoming section forms a power supply of the position sensing device.

48. (Original) The motor controller of claim 41, wherein the choke coil disposed on the driver side is inserted between a positive side and a negative side in series of the dc power supply.

49. (Original) The motor controller of claim 47, wherein the position sensing device further includes a capacitor coupled to the power incoming section in parallel.

50. (Original) The motor controller of claim 41, wherein the driver further includes a capacitor coupled to the dc power supply in parallel.

51. (Original) The motor controller of claim 41, wherein the driver further includes a resistor having a resisting value similar to a characteristic impedance of the wiring section, and the resistor is coupled to the wiring section in parallel.

Application No.: 10/781,203
Amendment Dated: June 1, 2005
Reply to Office Action of: March 25, 2005

MAT-8507US

52. (Original) The motor controller of claim 51, wherein the driver further includes a capacitor coupled to the resistor in series.

53. (Original) The motor controller of claim 41, wherein the wiring section comprises one of twisted two cables and a pair of shielded twisted cables.